Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Sc. (Genetic)/SEM-4/MSGEN (MBT)-403/2010

2010

MEDICAL BIOTECHNOLOGY

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Which year is considered to be the advent of the *Age of Biotechnology* after manufacture of a synthetic protein from a recombinant gene for the first time ?

a) 1974 b) 1977

c) 1978 d) 1979.

ii) In which year did Harvard researchers use Genetic Engineering techniques to produce rat insulin ?

a) 1976 b) 1978

c) 1980 d) 1982.

iii) The U.S. Supreme Court ruled that genetically altered life forms can be patented. A Supreme Court decision allowed the Exxon Oil Company to patent an oil-eating micro-organism. This ruling opened up enormous possibilities for commercially exploiting genetic engineering in which year ?

a) 1978 b) 1980

c) 1982 d) 1984.

iv) Modern human is distinct from Neanderthal based on genetic markers

a) Y chromosome b) mt DNA

c) SIS d) PCR-RFLP.

v) In which year did the U.S. Food and Drug Administration approve the first genetically engineered drug, a form of human insulin produced by bacteria ?

a) 1979 b) 1982

c) 1984 d) 1987.

vi) Failure of chromosome segregation at meiosis is due to

a) Non-distinction b) Polyploidy

c) Aneuploidy d) none of these.

vii) In which year did Alec Jeffrey introduce technique for DNA fingerprinting to identify individuals ?

a) 1983 b) 1984

c) 1987 d) 1990.

viii) In which year genetically engineered plants resistant to insects, viruses, and bacteria were field tested for the first time ?

a) 1983 b) 1985

c) 1988 d) 1990.

ix) In which year did the NIH approve guidelines for performing experiments in gene therapy on humans ?

a) 1982 b) 1985

c) 1987 d) 1988.

x) Genentech, Inc. produced the first human protein manufactured in a bacteria

a) Somatostatin b) Insulin

c) none of these d) both of these.

xi) Trans exualism is known as

a) Genetic sex b) Gender sex

c) Gonadal sex d) Genital sex.

xii) The genetic material transferred directly into the body of the patient is known as

a) *ex vivo* b) *in vivo*

c) *in vitro* d) none of these.

GROUP – B
(Short Answer Type Questions)

Answer on any *three* of the following.

3 × 5 = 15

2. "Human Genetic Diversity is low". Explain.
3. Define Cryptic rearrangements of Chromosome with example.
4. How does SRY gene regulate sex of the embryo ?
5. Define the condition of 46, XX Intersex.
6. Define the characteristics of ideal vector.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. Define anatomy of human chromosome. What are laboratory *in vitro* methods to study chromosome structure ? Describe the current method of studying chromosomal rearrangement in Genetic syndrome. 3 + 6 + 6

8. What is Genetic Sex ? How is sex of the embryo determined by Genotype ? How are internal and external sex organ differentiation controlled by Genotype of embryo ?

   3 + 5 + 7

9. Define genetic basis of Complex Genetic Disorders. How does it differ from monogenic disorders ? How do Genetic markers help to find alleles or causative gene in complex disorder like coronary artery disease ? What is that evidence that Diabetic type II is genetic ? 4 + 3 + 4 + 4

10. Write short notes on Genetic factors in any *five* of the following diseases: 5 × 3

    a) Schizophrenia

    b) Alzheimer disease

    c) Beta Thalassaemia

    d) Diabetes mellitus

    e) Epilepsies

    f) Obesity

    g) Male Infertility.

11. What are Pharmcogenetics and Pharmacogenomics ? What is Genetic Polymorphism ? Explain the molecular basis of Drug Designing. 2 + 2 +4 + 7